

Patent Claims

1. Said commissioning unit (1) with at least one said automatic commissioning unit (2),
which has said article shafts (4), which are arranged next to one another and one on top of
another and are sloped against the horizontal, and in which articles to be commissioned
can be stored, wherein each said article shaft (4) has a means for stopping and dispensing
articles at one of its longitudinal ends that is its lower end and can be filled with new
articles at its other, higher longitudinal end on the said bay filling side (B),
characterized in that
a said traveling bay-storage and retrieval unit (5) associated with the said article bay (3)
has a said article-handling device (51) that is movable in space with a said stack-of-articles
support (52), which can be positioned in an essentially vertical position with a
correspondingly vertical stack of articles picked up in the support at each higher
longitudinal end of a said article shaft (4) on the said bay filling side (B), wherein the said
stack-of-articles support (52) has a said lower individual article ejector (53), which is
displaceable in the transverse direction of the stack and is preferably equipped with a
counter, and by which the lowermost article of the said stack of articles (7) of the support
can be pushed into the said selected article shaft (4) or, as an alternative, it has a said
stack-of-articles holding-up device (54), which can be pushed up and by which a topmost
article of a pushed-up, obliquely positioned stack of articles reaches the said selected
article shaft (4) under the force of gravity or by means of a said upper individual article
ejector (53), which is displaceable in the transverse direction of the stack and is preferably
equipped with a counter.
2. Commissioning unit in accordance with claim 1,

characterized in that

a said stack-of-articles support (52) with a said lower individual article ejector (53) has a said, vertically adjustable guide (55) for a lower individual article to be pushed out.

5 3. Commissioning unit in accordance with claim 1 or 2,

characterized in that

the said stack-of-articles support (52) has a pair of stack-of-articles clamping plates with a said stack-of-articles pick-up (8) and with a said transversely adjustable longitudinal individual article clamping plate (12), by which a said picked-up stack of articles (7) can
10 be elastically clamped in the said transverse direction (Q) of the stack.

15 4. Commissioning unit in accordance with claim 1 or 2,

characterized in that

the said stack-of-articles support (52), which is held in an essentially vertical position in each operating position, has a said, doubly sloped angle sheet iron (14), wherein a said stack of articles (7) picked up in the support is laterally fixed in the root of the angle by the force of gravity and the stack of article is supported on the bottom side either on the said individual article ejector (53) or on the said stack-of-articles holding-up device (54) that can be pushed up.

20 5. Commissioning unit in accordance with claim 4,

characterized in that

the said article-handling device (51) has not only a said stack-of-articles support (52) for filling the said automatic commissioning unit (2) and optionally for removing and
25 transporting a stack of articles from and to storage areas, but additionally also a said article-handling unit (6), which is movable in space, for the removal of articles stack by

stack and for the transport of articles stack by stack from a said acceptance department (E) or from and to a supply bay, wherein the said article-handling unit (6) and the said stack-of-articles support (52) can be preferably aligned and positioned in relation to one another in a vertical position and a said stack of articles (7) picked up on the said article-handling unit (6) can be transferred into the said stack-of-articles support (52) by a said adjustable transverse stack-of-articles pusher (10).

6. Commissioning unit in accordance with claim 5, characterized in that

the said article-handling unit (6) of the said bay-storage and retrieval unit (5), which is movable in space, has a said bottom-side stack-of-articles pick-up (8), a said adjustable longitudinal stack-of-articles pusher (9), a said adjustable transverse stack-of-articles pusher (10), and a said adjustable longitudinal stack-of-articles clamping plate (12), which has especially a row of said spring-tensioned fingers (11) and is located in parallel to and opposite the said stack-of-articles pick-up (8) and presses in the clamped state a said stack of articles (7) picked up directly against the stack-of-articles pick-up in the said transverse direction (Q) of the stack by the longitudinal stack-of-articles clamping plate, especially by the said spring-tensioned fingers (11) thereof.

7. Commissioning unit in accordance with one of the claims 1 through 6, characterized in that

the said bay-storage and retrieval unit (5) can be displaced via a said guide or rail system (13) from and to at least one supply bay and can be positioned at a said selected lateral end (A) of a shaft of the supply bay, especially of a said angle sheet iron (14), wherein at least one said single stack of articles (7) to be handled is or can be arranged in each selected shaft and the stack of articles reaches a said aligned article pick-up (8) of the

article-handling unit by displacement in the said direction (S) of the stack, or conversely, it reaches the selected shaft from the article pick-up, wherein the said guide or rail system (13) may also have switches.

5 8. Commissioning unit in accordance with one of the claims 1 through 7,
characterized in that
the supply bay is a said higher-level supply bay (15), which is associated with the said
automatic commissioning unit (2) and is preferably located in the vicinity of the said article
bay (3) of the automatic commissioning unit.

10 9. Commissioning unit in accordance with one of the claims 7 or 8,
characterized in that
the supply bay is a said buffer (16), which is associated with the said acceptance
department (E) and is preferably located in the vicinity of the unpacking station, at which
15 the said stacks of articles (7) are unpacked from a said collective box (17) and are put
together.

20 10. Commissioning unit in accordance with claim 9,
characterized in that
the said unpacked stacks of articles (7) are put together on a said stack-of-articles stacker
plate (18), which has the shape of a part of at least one bay level of the supply bay,
especially said angle sheet irons (14), wherein the said bay-storage and retrieval unit (5) is
displaceable for taking over an article by displacement also to the stack-of-articles stacker
plate (18) via the said rail or guide system (13) and can be positioned at this stack-of-
25 articles stacker plate, especially at a said lateral end (A) of a sheet iron.

11. Commissioning unit in accordance with claim 10,
characterized in that
the said stack-of-articles stacker plate (18) is also displaceable, especially displaceable on a
conveyor belt or on a chute and/or rotatably around a said vertical axis (19) by preferably
90° or 180° for positioning to the bay-storage and retrieval unit.

12. Commissioning unit in accordance with claim 11,
characterized in that
a hand or foot switch is provided for adjusting the said stack-of-articles stacker plate (18).

13. Commissioning unit in accordance with one of the claims 10 through 12,
characterized in that
an automatic unpacking unit with a gripping arm is provided, which grasps a preferably
horizontal stack of articles from an opened collective box and deposits it on the said stack-
of-articles stacker plate (18).

14. Commissioning unit in accordance with one of the claims 7 through 13,
characterized in that
the supply bay has said angle sheet irons (14) arranged next to one another in one or more
planes arranged one on top of another.

15. Commissioning unit in accordance with one of the claims 7 through 14,
characterized in that
the said angle sheet iron (14) is doubly sloped and forms a chute that has a rectangular
cross section and is oblique in the longitudinal direction, wherein the root of the angle is
located at the lowest point in each cross section over the length of the chute and the two

surfaces of the legs of the angle are stop faces for a said picked-up stack of articles (7) and, furthermore, a said detachable, preferably depressible article stop (20) is provided at the lowest end of the chute.

5 16. Commissioning unit in accordance with claim 15,
characterized in that
the said slope (a) of the chute is approx. 20° in the longitudinal direction and the said
slope (b) of the base of the chute is approx. 15° in the transverse direction.

10 17. Commissioning unit in accordance with claim 15 or 16,
characterized in that
a said stack of articles (7) picked up in the chute has a longitudinal fixing aid, which
presses the stack of articles against the said article stop (20).

15 18. Commissioning unit in accordance with claim 17,
characterized in that
the said longitudinal fixing aid is a said rolling cart (21).

20 19. Commissioning unit in accordance with one of the claims 7 through 17,
characterized in that
the longitudinal fixing aid is a longitudinally adjustable article stop.

25 20. Commissioning unit in accordance with claim 17,
characterized in that
the said longitudinal fixing aid is a spring-pretensioned article stop.

21. Commissioning unit in accordance with one of the claims 14 through 19,
characterized in that
the supply bay is a double bay, which is arranged back to back.

22. Commissioning unit in accordance with one of the claims 1 through 21,
characterized in that
the article-handling unit of the bay-storage and retrieval unit has a said coupling pin (22),
which can be caused to engage a corresponding recess acting as a centering aid at a
selected shaft of a supply bay.

23. Commissioning unit in accordance with one of the claims 1 through 22,
characterized in that
the article-handling unit has a stop, especially a said small roller (23), which can be caused
to engage the said stack-of-articles stop (20) of a shaft for releasing or depressing the
stack-of-articles stop, wherein the stop of the article-handling unit may also be the said
adjustable longitudinal stack-of-articles pusher (9) itself.

24. Commissioning unit in accordance with one of the claims 1 through 23,
characterized in that
the said stack-of-articles pick-up (8) of the said bay-storage and retrieval unit (5), the shaft
and the angle sheet iron of the said higher-level supply bay (15), the said buffer (16) and
the said stack-of-articles stacker plate (18) at the said acceptance department (E) have the
same designs in terms of length, width and optionally slope (longitudinal slope (a),
transverse slope (b)), wherein the said higher-level supply bay (15) and/or the said buffer
(16) may also have different sizes, especially in width.

25. Commissioning unit in accordance with one of the claims 1 through 24,
characterized in that
the said article-handling unit (6) is fastened via a said pivot axis (24) on a said carriage
(25), which is transversely displaceable on a said transverse rail (26) with a said slope (a)
5 in the depth of the shaft or in the longitudinal direction of the shaft of the supply bay,
especially approx. 20°, wherein the said transverse rail (26) is rigidly or telescopically
fastened on a said, vertically displaceable lifting carriage (27) of the said bay-storage and
retrieval unit (5).

10 26. Commissioning unit in accordance with one of the claims 1 through 24,
characterized in that
the said article-handling device (51) is divided into two parts and has a said separate,
vertically adjustable stack-of-articles pick-up unit (28) with a plurality of said angle sheet
15 irons (14) of the type, position and size of the said stack-of-articles pick-up (8) and of the
supply bay, which has at least one said adjustable second longitudinal stack-of-articles
pusher (9') of its own, wherein a plurality of stacks of articles (7) can be conveyed by the
said stack-of-articles pick-up unit (28) from the said buffer (16) or from the stack-of-
articles pick-up to the said higher-level supply bay (15) and loaded and removed, and a
20 separate, vertically adjustable article bay loading unit, which is in turn divided into two
parts and has, on the one hand, a said, vertically adjustable individual stack-of-articles
pick-up (8'), optionally a plurality of individual stack-of-articles pick-ups, with the said
longitudinal stack-of-articles pusher (9) and with another said transverse stack-of-articles
pusher (31) and, on the other hand, a said gripping unit or stack-of-articles support (51),
25 which is movable in space, with the said bottom-side stack-of-articles pick-up (8), the said
longitudinal stack-of-articles clamping plate (12) with the said angle stop (32) and with the
said adjustable transverse stack-of-articles pusher (10) as well as with the said individual

article ejector (53), wherein a said single selected stack of articles (7) can be conveyed by the said article bay loading unit from the supply bay (said higher-level supply bay (15), said buffer (16)) or from the said stack-of-articles stacker plate (18) of the said acceptance department (E) to the said automatic commissioning unit (2) and be loaded there individually into a said selected article shaft (4) of the said automatic commissioning unit (2).

27. Commissioning unit in accordance with claim 26, characterized in that

for loading the stack of articles into the said automatic commissioning unit (2), the said stack of articles (7) can be removed by the said individual stack-of-articles pick-up (8') from the supply bay in the longitudinal direction of the stack by displacement with the said longitudinal stack-of-articles pusher (9) and can be conveyed to the said automatic commissioning unit (2) and it can be positioned and individually loaded after transfer or transverse displacement (V) of the said stack of articles (7) from the said individual stack-of-articles pick-up (8') by the said additional transverse stack-of-articles pusher (31) onto the said bottom-side stack-of-articles pick-up (8') of the said aligned gripping unit or stack-of-articles support (52) and after clamping of the entire stack of articles in the said transverse direction (Q) of the stack by the said longitudinal clamping plate (12) having spring-tensioned fingers at the said selected article shaft (4) of the said automatic commissioning unit (2) by moving the gripping unit.

28. Commissioning unit in accordance with claim 26 or 27, characterized in that

the said gripping unit or stack-of-articles support (52) is fastened via a said axis of rotation (33) to a said vertically adjustable lifting carriage (34), which is in turn vertically

displaceable on a said vertical bar (35) of the said bay-storage and retrieval unit (5), which said vertical bar is articulated on the bottom side around at least one axis (C).

29. Commissioning unit in accordance with claim 28,

characterized in that

the said vertical bar (35) has a shorter length than the said vertical bar (36) on which the said individual stack-of-articles pick-up (8') and the said stack-of-articles pick-up unit (28) are vertically displaceable.

30. Commissioning unit in accordance with one of the claims 1 through 29,

characterized in that

at least one separate bay-storage and retrieval unit is provided, which is associated with the said stack-of-articles stacker plate (18) at the said acceptance department (E), the said buffer(s) (16) and/or the higher-level supply bay(s) or can be displaced thereto and can take over or transfer said stacks of articles (7) there, wherein the separate bay-storage and retrieval unit has exclusively a said stack-of-articles pick-up (8'), preferably a multiple-load pick-up means for a plurality of said stacks of articles (7) (i.e., not an article bay loading unit), which is associated with the automatic commissioning unit, and the separate bay-storage and retrieval unit may optionally also be operated in a commissioning unit that is not of this class.

31. Process for making ready and loading articles in a said commissioning unit (1), especially in accordance with one of the claims 1 through 30, with at least one said automatic commissioning unit (2), which has at least one said article bay (3) with said article shafts (4), which are arranged next to one another and one on top of another and are sloped against the horizontal and in which articles to be commissioned can be stored, wherein

each said article shaft (4) has a means for stopping and dispensing the articles at its lower longitudinal end and can be filled with new articles at its higher longitudinal end on the bay filling side (B),

characterized in that

5 a said traveling bay-storage and retrieval unit (5), which is associated with the said article bay (3), with a said article-handling device (51), which is movable in space, with a said stack-of-articles support (52), is positioned in an essentially vertical position of the support with a correspondingly vertical stack of articles picked up in the support at a selected, higher longitudinal end of a said article shaft (4) on the said bay filling side (B),
10 wherein the lowermost article of the said stack of articles (7) of the support can be pushed into the said selected article shaft (4) by a said lower individual article ejector (53) displaceable in the transverse direction of the stack or, as an alternative, a topmost article of a pushed-up, obliquely positioned stack of articles is introduced into the said selected article shaft (4) by the force of gravity or by a said upper individual article ejector (53)
15 that is displaceable in the transverse direction of the stack.

32. Process in accordance with claim 31,
characterized in that
the said bay-storage and retrieval unit (5) and especially the said stack-of-articles support
20 (52) are used for the transport of articles stack by stack from the said acceptance department (E) and/or from and to supply storage areas.

33. Process in accordance with claim 31 or 32,
characterized in that
25 a said separate article-handling unit (6) is used for the transport of articles stack by stack and for the transfer of articles stack by stack from the said acceptance department (E)

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Figure 1

through

Figure 25

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